

STRP Report 16

New Approaches to Suburban Land-Use Planning That Support Transit Use

Experience and Model Policy Wording

a project managed by
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Canadian Urban Transit Association
Association canadienne du transport urbain

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Prepared by:

Entra Consultants Inc.

November 2000

CUTA Mission Statement

CUTA is the association of providers of urban transit services, suppliers and related organizations in Canada. Its mission is to promote the role of urban transit in enhancing mobility, and to support its members in the fulfilment of their mandate.

Disclaimer

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Abstract This report reviews the actual experiences of suburban municipalities in North America that have implemented transit-oriented development, traditional neighbourhood design, or other land use planning approaches that support transit use. The intent of this study is to develop model policy wording that might be used in suburban locations based on the experiences and successes of suburban municipalities and jurisdictions that are presently following a transit-supportive land use planning approach. Case studies were developed for: Sacramento CA, Rockville MD, Vancouver WA, San Diego CA, Snohomish County CA, Calgary AB, and Markham ON. Model Policies were developed in the areas of: Transit-Oriented Development, Transit-Friendly Design, and Community Planning. It is evident from the case studies that successful implementation of transit-supportive land use is not always founded on strong land use policies. Some jurisdictions have had success in implementing transit-supportive suburban land use, with policies that are not that well established, because they demonstrate the necessary political will and because there is market/developer interest in implementing land use that is supportive of transit. Alternatively, strong land use policies do not ensure success; others have failed in implementing transit-supportive land use, despite having extensive transit-supportive land use policies, due to unfavourable market forces, inadequate funding or lack of political commitment.		
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New Approaches to Suburban Land-Use Planning That Support Transit Use; Experience and Model Policy Wording

Final Report

Executive Summary

This research paper reviews the actual experiences of suburban municipalities in North America that have implemented transit-oriented development, traditional neighbourhood design, or other land use planning approaches that support transit use. The emphasis is on land use policies that support transit in a suburban context and their implementation. The intent of this research paper is to develop model policy wording that might be used in suburban locations based on the experiences and successes of suburban municipalities and jurisdictions that are presently following a transit-supportive land use planning approach.

TRANSIT-SUPPORTIVE SUBURBAN LAND USE PLANNING

Transit-supportive land use planning approaches were identified from the research. The approaches are categorized according to the primary objectives and the usual scale or level of planning involved. The identified approaches include:

Transit-Oriented Development (TOD)

TOD is a development pattern characterized by the concentration of jobs, moderate and high-density housing, retail uses and services, and complementary public uses in mixed-use developments at strategic points along an area transit system. The strategic points of concentrated development in the TOD approach can vary in scale, configuration and focus. Depending on their character, they are referred to as suburban activity centres, transit-focused development, transit malls or pedestrian malls and transit corridor districts.

Transit-Friendly Design

Transit-friendly design, also known as transit-supportive subdivision design or transit-compatible design, is most often a local planning or transit authority initiative that is implemented when developing new subdivisions, as well as in retrofit situations along established or newly developed transit routes.

Community Planning

Within the realm of community planning, there are several land use planning approaches that support transit use and have applicability in a suburban context including traditional neighbourhood design, Planned Unit Development and Livable Communities.

CASE STUDIES

Case studies of experience with specific land use planning approaches, transit-supportive policies and implementation of those policies were completed based on information obtained from a literature review, interviews with the selected municipalities and policy documents provided by municipal contacts.

Sacramento County, California

The County uses the transit-oriented development concept as part of a growth strategy to assist the County in implementing the guiding principals of the General Plan Land Use Element. In the TOD strategy, high-density housing and a majority of neighbourhood-serving retail and commercial uses, will be concentrated in mixed-use developments located at strategic points along the regional transit system. This linkage between land use and transit is designed to result in an efficient pattern of development that supports a regional transit system and makes significant progress in reducing traffic congestion and air pollutants.

City of Rockville, Maryland

The City is currently experiencing high levels of congestion. The City is using a transit-oriented development approach to focus on the integration of land use and transportation requirements and to encourage increased use of alternative modes of travel. The City is not having difficulty implementing transit-supportive measures, despite the lack of a public facilities ordinance, because of the political support staff receives. The City has been able to convince developers of the need for alternative modes using a marketability argument.

City of Vancouver, Washington

The City of Vancouver has a Comprehensive Plan that supports increased use of transit as well as Neighbourhood Action Plans (NAP) that deal with specific neighbourhood issues. However, the key to the City's approach is Vancouver Municipal Code - Title 20 - Zoning Ordinance. Chapter 20.95, Transit Overlay District. The purpose of the Transit Overlay District is to improve mobility by providing for pedestrian and transit-friendly development through a mix of residential, commercial and employment opportunities that focus appropriate densities and design characteristics within the designated transit corridors.

City of San Diego, California

The City of San Diego supports transit-oriented development, as well as transit-friendly design. The City of San Diego believes that land use patterns and transit development should be mutually supportive and that public transit must play an increasingly important role in San Diego's total transportation system. The City is committed to the pursuit of an

urban form that includes a pedestrian-oriented, mixed-use, multi-modal transportation environment. Specifically, the City is committed to incorporating TOD guidelines into its General Plan policies, community plan policies and so forth.

Snohomish County, Washington

The County of Snohomish has a long history of involvement in transit-friendly design and is supportive of several aspects of transit-oriented development. The key policy document for the county is the Puget Sound Regional Council VISION 2020. The strategy supports transit and transit-oriented development in many of its policies. The document puts forth a vision and policies based on a centres and corridors plan for the central Puget Sound region encompassing King, Kitspa, Pierce and Snohomish counties. It combines a public commitment to a growth management vision with the transportation investments and programs and economic strategy necessary to support that vision.

City of Calgary, Alberta

Calgary's objective is to make public transit an important determinant of new subdivision design by introducing transit-friendly design considerations into the planning and development process as early as possible. In new suburban locations, the key policy document is the Sustainable Suburbs Study. The study presents a number of policies related to the major components of a sustainable community, including mixed-use activity centres and transportation. The City's Transit Friendly Design Guide contains principles and policies for transit-supportive development and identifies techniques for improved integration of transit into residential and non-residential areas.

Town of Markham, Ontario

The Town of Markham has adopted traditional neighbourhood design planning principles in its urban growth areas and presently has several TND projects under construction. The focus of the Town's policies is community design. Nonetheless, the planning approach is generally transit-supportive. All of the Town's policy direction pertaining to increased transit is provided through the secondary plans that are prepared for the new planning districts in the Town. The Town's secondary plans for new urban expansion areas include a Community Amenity Area designation that provides for mixed-use, higher density land use along major collector roads and is intended to support planned higher frequency transit in the corridor.

MODEL POLICY WORDING

Examples of land use policies that support transit use in a suburban context are identified in the research paper. The policies are provided as a sample of the kinds of land use policies that are being implemented in an effort to increase suburban transit use. The policies are categorized on the basis of the planning approach most relevant in the municipality or jurisdiction where they originate.

It is evident from the case studies that successful implementation of transit-supportive land use is not always founded on strong land use policies. Alternatively, strong land use policies do not ensure success. Clearly, successful implementation of transit-supportive land use hinges on a commitment to transit.

In those jurisdictions where there is well established land use policy in support of transit, the commitment to transit is evident in the comprehensiveness of the approach and the extent of the transit-supportive policies. Where there is a commitment to transit, the planning approach recognizes the role and benefits of transit, and policies and related planning tools extend beyond land use to address the need for coordination between planning agencies, the process of planning and reviewing development and its implementation, and financial and other incentives in support of transit.

From the case studies, it appears that the specific wording of land use policies is not a crucial determinant of success. Some jurisdictions have had documented success in implementing transit-supportive suburban land use with policies that are not that well established. In these cases, the commitment to transit is not evident in the land use policies but lies elsewhere. These jurisdictions are successful because they demonstrate the political will to get transit-supportive land use implemented, there is market or developer interest in implementing land use that is supportive of transit or creativity in implementing transit-supportive land use.

Just as some jurisdictions enjoy success without extensive land use policies, others fail in implementing transit-supportive land use, despite having extensive transit-supportive land use policies, due to unfavourable market forces, inadequate funding or lack of political commitment.

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New Approaches to Suburban Land-Use Planning That Support Transit Use; Experience and Model Policy Wording

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1. Introduction

Recent developments in land use and transportation planning have underscored the relationship between transportation and land use, with the evolution of an understanding of the links between them. Land use planners have responded with a variety of planning approaches, and an even wider variety of names and descriptions including transit-oriented development, transit-focused development, suburban activity centres, transit villages, transit malls, pedestrian pockets, traditional neighbourhood design, New Urbanism and Livable Communities, to name several.

These approaches range from being architecturally focused with transit issues as a sideline (e.g., New Urbanism), to serious attempts to orient development around transit facilities. Each has valuable lessons from which to learn.

This research paper reviews the actual experiences of suburban municipalities in North America that have implemented traditional neighbourhood design, transit-oriented development, or other land use planning approaches that support transit use. The emphasis is on land use policies that support transit in a suburban context and their implementation. Transit-supportive design guidelines are a key tool in implementing transit-supportive land use planning approaches in many suburban municipalities but these guidelines are not the focus of this paper.

The intent of this research paper is to develop model policy wording that might be used in suburban locations based on the experiences and successes of suburban municipalities and jurisdictions that are presently following a transit-supportive land use planning approach.

In developing model policy wording, there is recognition that land use and transit measures can be applied at a variety of different planning levels from regional to neighbourhood to a transit station site and that the requirements for success vary depending on the planning context.

Chapter 2 of this paper briefly describes the approach used in researching the topic. Transit-supportive land use planning approaches identified from the research and their similarities or differences are described in Chapter 3. Case studies of experience with specific land use planning approaches, transit-supportive policies and implementation of

those policies are presented in Chapter 4 based on the literature review, the interviews with the selected municipalities and the policy documents provided by the municipal contacts. Chapter 5 presents model policy wording that might be used by other municipalities depending on the planning approach and level involved. Conclusions are provided in Chapter 6, including some observations about the success of municipalities in implementing transit-supportive land use policies in a suburban context.

2. Study Approach

LITERATURE REVIEW

The Canadian Urban Transit Association (CUTA) completed a search of available literature related to the research topic and provided the compiled documents to the consultant for review.

The documents provided summaries of a wide a range of experiences from cities across Canada and the United States related to land use planning approaches that support transit use. Brief summaries were prepared with examples of the planning approaches, policies and issues faced in municipalities across North America.

A list of land use planning approaches that support transit use was compiled and common themes were identified based on the literature review. Relevant approaches and related land use policies were identified for further research from the various planning approaches.

INTERVIEWS

The results of the literature review were used to select municipalities for in-depth telephone interviews. Potential interview sites were selected on the basis of having been identified in the literature, having a suburban context and representing various:

- ~ planning approaches;
- ~ levels of government; and
- ~ perspectives.

The list of potential interview sites was reviewed with CUTA staff and refined based on the input received and the results of an internet search of available information, particularly for potential sites in the United States.

The selected municipalities were contacted by the consultant to establish a contact person and create familiarity with the research project, and to determine their interest in being interviewed. The contacts that were established for the interviews represented a variety of experiences and perspectives covering:

- ~ Canada and the United States;
- ~ municipalities ranging from 50,000 to over 1,000,000 people;
- ~ regional and local governments and agencies; and

- planning, transportation and transit jurisdictions.

Once interviews were scheduled, the contacts were provided with a discussion outline for the telephone interview and were asked to assemble policy documents of relevance in their jurisdiction.

The consultant conducted informal telephone interviews with each of the contacts. The duration of the interview was typically 60 to 90 minutes. Items discussed during the interviews comprised:

- the municipality's/agency's reasons for initiating a land use planning approach that supports transit use;
- current transit-supportive projects within the municipality;
- the extent and specific focus of the municipality's/agency's policies;
- a quantitative and qualitative assessment of the policies in a suburban context;
- insights into the policies that are successful or not; and
- the planning measures or implementation tools that are needed in support of the policies.

REVIEW OF POLICY DOCUMENTS

As part of the interviews, municipalities were asked to provide documentation for review by the consultant that included specific policy wording.

The municipal policy documents were reviewed and summarized, and specific policies were identified that might be used by other municipalities depending on the planning approach and level involved.

3. Transit-Supportive Suburban Land Use Planning

Transit-supportive land use planning approaches identified from the research and their similarities or differences are described in this chapter. The approaches are categorized according to the primary objectives and the usual scale or level of planning involved.

3.1 Transit-Oriented Development

Broadly defined, transit-oriented development (TOD) is a development pattern characterized by the concentration of jobs, moderate and high-density housing, retail uses and services, and complementary public uses in mixed-use developments at strategic points along an area transit system. The location, design, configuration and mix of uses in a TOD provides an alternative to current suburban development trends by emphasizing a pedestrian-oriented environment and reinforcing the use of transit.¹

TOD has a regional perspective in that points of concentrated development are intended to be part of a series of points located along the area transit system and the designation of points most often falls under the jurisdiction of a regional or upper-tier planning agency.

Regional policies most often focus on promoting increased transit use, creating a structure of transit nodes and corridors and encouraging local governments to designate suitable development in planned nodes and corridors.

The strategic points of concentrated development in the TOD approach can vary in scale, configuration and focus. Generally, they can be characterized as nodes or corridors. These points of concentrated development are referred to by a variety of names depending on character of the development and the nature of the transit serving the development. Implementation of the individual nodes and corridors in the TOD approach is usually the responsibility of the local planning authority, sometimes in conjunction with the regional transit authority.

SUBURBAN ACTIVITY CENTRE

A suburban activity centre (SAC) is a component of suburban growth where office, commercial and retail uses and services are developed in very large concentrations. Distinctive common characteristics include:

- ~ enough employment-generating uses to rival a region's downtown;
- ~ region-serving commercial uses that draw customers from the surrounding suburban communities; and
- ~ a location adjacent a major transportation facility, such as a transit centre.²

Current thinking with respect to SACs is that they should:

- ~ create transit-oriented, mixed-use nodes;
- ~ provide interconnected, multi-modal street systems;
- ~ encourage a pedestrian orientation;
- ~ provide appropriate parking configurations; and
- ~ minimize parking supply.

Bellevue, Washington is highlighted in the literature as a suburban city that has successfully implemented the SAC concept. Located 19 kilometres from Seattle, Bellevue's downtown has become a major suburban activity centre with over 435,000 square metres of office space and 390,000 square metres of retail and commercial space. The centre is the result of a comprehensive set of planning and management tools specifically designed to reduce reliance on automobiles. The focus of transit is a timed transfer transit centre located in the office core that is served by both local and regional bus routes.

TRANSIT-FOCUSED DEVELOPMENT

Transit-focused development is the implementation of the TOD planning approach at rail transit stations. It is described as development, generally within a kilometre of rail transit stations, that provides sufficient densities and mixes of activities and convenient pedestrian linkages to support significant transit ridership.³ Required components of transit-focused development, in addition to development adjacent a rail station, include:

- ~ coordination of land use planning and transit service provision;
- ~ integration of transit facilities with land uses; and
- ~ design of development with features known to enhance transit use.

Transit-focused development is most successful when:

- ~ stations are located in prime regional and community nodes of activity attractive to typical market forces;
- ~ the regional and local real estate market is active; and
- ~ public policies and regulations permit or encourage intensive development in station areas.

The Pleasant Hill BART station, located 48 kilometres east of San Francisco, is an example of a successful transit-focused development within a suburban context. Pleasant Hill encouraged the aggregation of properties to create a cohesive development area and used a Specific Plan that provided policies and design guidelines to attract development of 140,000 square metres of office space and 1,600 apartment units within 500 metres of the BART station.

Another successful example is Toronto's North York Centre. Served by three transit stations on two subway lines, this Major Centre in Toronto's Official Plan has become a thriving downtown in suburban North York. The North York Centre is multi-use in character, containing a variety of office, retail, service, institutional, hotel, entertainment, residential and open space uses. It is planned for in excess of 4.5 million square metres of development within walking distance of the subway stations.

TRANSIT MALLS / PEDESTRIAN MALLS

Transit malls and pedestrian malls are usually located in a major activity corridor or centre. Transit vehicles are the exclusive or dominant form of transportation in association with pedestrian travel and possibly cycling. Malls are usually at a scale of a couple of city blocks or less and comprise a mix of commercial and retail uses and services.

TRANSIT CORRIDOR DISTRICT

In theory, transit corridor districts (TCDs) are intended to serve as prime locations of transit-oriented land uses and as a means of creating an environment where mobility is provided by non-automotive means such as walking, cycling and transit.⁴

The focus of the TCD concept is on:

- separating transit-oriented and auto-oriented land uses;
- creating a mix of higher density land uses along a major transit route; and
- providing a high quality access system for pedestrians and cyclists to permit easy connections between buildings and transit vehicles.

TCDs are intended to be separate transit corridors, located a kilometre or so from parallel arterial corridors. With the exception of local traffic, the corridor would be restricted to transit vehicles only. TCDs are expected to provide in the order of 3,000 residential units and 140,000 square metres of office/commercial development within 500 metres of the corridor.

TCD policies are intended to:

- designate a future system of transit corridors;
- separate transit-oriented and auto-oriented land uses;
- control through traffic in transit corridors; and
- designate the type and location of transit stops.

3.2 Transit-Friendly Design

Transit-friendly design, also known as transit-supportive subdivision design or transit-compatible design, is most often a local planning or transit authority initiative that is implemented when developing new subdivisions, as well as in retrofit situations along established or newly developed transit routes.

The basic planning principles of transit-friendly design are:

- provide a mix of uses at densities that will support transit;
- design streets to be pedestrian-oriented;
- minimize walking distances by providing direct pedestrian connections to transit stops;
- create street layouts that accommodate transit vehicles in an efficient manner; and
- explicitly involve the transit authority in the planning and design process.

In addition to these basic planning principles, there are numerous design considerations that are usually incorporated in transit-friendly design guidelines. These include:

- organize land uses and density to benefit from transit; avoid large, homogenous use areas;
- provide a grid of connected streets within neighbourhoods and between communities;
- promote urban design that encourages walking and cycling;

- ~ build quality, user-friendly and integrated transit facilities with amenities, such as bike facilities, at transit stop locations;
- ~ ensure adjacent uses face potential transit routes and locate buildings to benefit transit users (e.g., shopping centres, employment nodes);
- ~ incorporate transit facilities in the design of focal points (e.g., office complexes, employment nodes, shopping centres) and integrate community services (e.g., daycare) and institutional uses with the facilities;
- ~ control the amount, cost and location of parking; and
- ~ stage development along with potential transit services and avoid gaps in development (i.e., leap-frogging).

Clearly, many of these are elements of successful transit-oriented developments. The primary differences between TOD and transit-friendly design are the development intensity and expectations or objectives with respect to automobile trip-reduction. Whereas the TOD planning approach involves an aggressive automobile trip-reduction strategy that can require the complete elimination of automobiles in some instances, transit-friendly design objectives tend to be more moderate, focusing on creating support for transit as a viable alternative to the automobile.

Transit-friendly design is a popular planning approach in many suburban locations across Canada and the United States. Examples from the literature on transit-friendly design initiatives that are often referenced include Calgary, San Diego and Snohomish County, north of Seattle.

3.3 Community Planning

Within the realm of community planning, there are several land use planning approaches that support transit use and have applicability in a suburban context. These planning approaches do not have transit supportiveness as their primary objective but they can contribute to higher transit use where they are successfully implemented. Implementation is usually the responsibility of the local planning authority.

TRADITIONAL NEIGHBOURHOOD DESIGN

Traditional neighbourhood design (TND), also commonly labeled neo-traditional design or New Urbanism, is an approach to land use and development that borrows from an older pattern of urban development. The design principles of TND include a commercial core within walking distance of a majority of residents, a well-connected street network, narrow streets with curbside parking and back-lot alleys, mixed uses and varying densities of housing.⁵

The primary focus of TND is on creating traditional-style neighbourhoods, in terms of both form and function. The principles support a pattern of development that is conducive to increasing walking and transit use and to reducing dependence on the automobile.

The Town of Markham, a suburban municipality of 180,000 people located north of Toronto, has adopted the TND planning principles in its urban growth areas and presently has several TND projects under construction.

PLANNED UNIT DEVELOPMENT

A Planned Unit Development (PUD) is a large area that is planned and zoned as a single unit rather than as several individual parcels. This approach to planning generally involves using a set of requirements established specifically for the project, rather than existing regulations. The primary objectives are usually to create a greater mix of housing types and more common open space than might otherwise be achieved.⁶

Common features of transit-supportive PUDs are increased residential densities over more conventional approaches, a well-configured internal circulation system of pathways, pedestrian links and roadways, and an activity centre or transit hub. These features support efficient routing of transit services and easy access to transit stops.

LIVABLE COMMUNITIES

The primary objectives of Livable Communities initiatives are to protect the natural environment and increase quality of life. Sustainability in terms of infrastructure requirements, the economy and natural environment are key considerations in the determination of appropriate land uses. This approach to land use planning tends to result in compact, multi-dimensional land use patterns that:

- ~ control sprawl;
- ~ feature a mix of uses;
- ~ promote walking, bicycling, and transit access to employment, education, recreation, entertainment, shopping and services; and
- ~ minimize the impacts of automobiles.

Use of non-automobile travel alternatives is reinforced by economic development and transportation investment decisions that support the desired land use patterns, wherever possible.

3.4 Common Themes

The review of transit-supportive land use planning approaches serves to emphasize the high level of inter-relatedness between many of the approaches. Upon review of the various approaches, it is apparent that there are elements that are common to most, if not all, of the transit-supportive land use planning approaches. These common themes include:

- ~ create a mix of higher density land uses near transit routes;
- ~ promote urban design that creates pedestrian-friendly streets, encouraging walking and cycling;

- ~ minimize walking distances by providing pedestrian pathways or direct pedestrian connections to transit stops;
- ~ build quality, user-friendly transit facilities and provide amenities at transit stop locations;
- ~ require transit-sensitive site designs;
- ~ match the staging of development with potential transit services to avoid gaps in development (i.e., leap-frogging); and
- ~ control the amount, cost and location of parking.

These common elements lead to policies that are often very similar, despite the proclaimed differences in land use planning approaches.

4. Case Studies

The results of the literature review were used to select municipalities for in-depth telephone interviews. As part of the interviews, municipalities were asked to provide documentation that included specific policy wording for review by the consultant.

Case studies of experience with specific land use planning approaches, transit-supportive policies and implementation of those policies are presented in this chapter. The information obtained from the literature review, the interviews with the selected municipalities and the policy documents provided by the municipal contacts was supplemented with available information from an internet search of municipal or agency homepages and the like.

4.1 Sacramento County, California

Sacramento County encompasses approximately 994 square miles. Sacramento County is expanding rapidly and is becoming more metropolitan. The population of the county is approximately 1,177,800. However, densities are very low outside of the City of Sacramento and there is a lot of open space. Sacramento County has five incorporated cities: Citrus Heights, Folsom, Galt, Isleton, and Sacramento. Approximately 34 percent of the county's population lives in the City of Sacramento. Next to the City of Sacramento, the next largest city is Citrus Heights with a population of approximately 80,000 people. The County is an employment centre for surrounding counties and is now experiencing heavy congestion on the roadways.

Sacramento Regional Transit District (RT) is the area transit authority. Transit is operated by Union Pacific, CalTrans and various municipalities. RT is governed by a seven-member Board of Directors comprising members of the Sacramento City Council and the Sacramento County Board of Supervisors. RT works with the County to establish what is needed to support transit service, how compact development should be, where to grow and the best routes for transit.

RT operates 69 bus routes and 20.6 miles of light rail covering a 418 square-mile service area. Passenger amenities include 31 light rail stops or stations, nine bus and light rail transfer centres and 10 free park-and-ride lots. The fiscal year 2000 operating budget is \$77.4 million, with a capital program of \$46.6 million.

Annual ridership has steadily increased on both the bus and light rail systems from 14 million passengers in 1987 to over 27 million passengers in 1999. Weekday light rail ridership averages about 29,000, which accounts for approximately 30% of the total system ridership.

The impetus for transit-supportive land use initiatives in Sacramento was the federal Inter-modal Surface Transportation Efficiency Act (ISTEA). As a result of ISTEA, the County had to implement initiatives to get funding. The County's approach to land use planning focuses primarily on transit-oriented development.

The County uses the transit-oriented development concept as part of a growth strategy to assist the County in implementing the guiding principles of the General Plan Land Use Element. In the TOD strategy, new moderate and high-density housing as well as new public uses and a majority of neighbourhood-serving retail and commercial uses, will be concentrated in mixed-use developments located at strategic points along the regional transit system. This linkage between land use and transit is designed to result in an efficient pattern of development that supports a regional transit system and makes significant progress in reducing traffic congestion and air pollutants. The TOD's mixed-use clustering of land uses within a pedestrian-friendly area connected to transit provides for growth with minimum environmental and social costs.

The County has some very relevant and specific policies linking suburban land use to transit use. Land Use Policy No.4 (LU-4) pertaining to infill development is intended to prevent sprawl and allow for efficient servicing, including providing transit. Land Use Policy No.14 (LU-14) establishes minimum densities for residential and commercial development within 0.25 to 1.0 mile of a transit corridor. Land Use Policy No.26 (LU-26) relating to transit-oriented development (TOD) is intended to create a mix of uses at higher densities in core areas (i.e. neighbourhood centres). The objective is in part to create a balance of jobs and housing that will support transit. To be successful, the core area needs to be served by transit.

The County also has related policies for air quality. Air Quality Policy No.15 (AQ-15) is a County Ordinance aimed at lowering the individual use of automobiles. AQ-15 requires a fifteen- percent reduction in emissions from the level that would be produced by a base-case project assuming full trip generation per the current Institute of Transportation Engineers' (ITE) Trip Generation Handbook.

The County is currently completing an update of its General Plan. Part of the update involves a review and assessment of the policies that directly or indirectly relate to transit. One of the items the County is looking at is whether the 1993 General Plan has been implemented and, if not, why not. They are finding that it has not been implemented in many instances.

Sacramento County has a very market-driven Board of Supervisors. The County's policies are targeting residential densities in transit corridors in the range of 7 to 10 units per acre (upa). Area developers argue that there is no market for these densities. They consider 4 upa to be high density. As a consequence, there is a lot of downzoning.

RT suggests it needs an average of 7 upa in a corridor to provide transit. On average in the County, corridors are being developed at 4 to 5 upa. The insufficient densities affect the provision of planned services and the financing of services.

There were problems with LU-14 initially. However, the problems were largely communication problems between the Long-Range Planning Division and Current Planning staff. Those problems have largely been dealt with but the County continues to have conflicts with municipal objectives.

With respect to LU-26, the 1993 General Plan Diagram shows TOD locations. However, through individual project implementation many of the TOD locations have been displaced by alternative land use approvals. An example of this is North Vineyard Station Specific Plan (Resolution 93-1338) where medium density residential and commercial uses were moved away from the core area and replaced with single-family residential. This defeats the purpose of having a transit station in the town centre area and makes it difficult for users to find adequate parking to leave their cars, thus discouraging the use of the transit alternatives and increasing automobile use.

The County feels that the trip reduction levels in AQ-15 need to correlate better with the policy requirements of LU-4, LU-14 and LU-26.

The recommendations being prepared as part of the General Plan Update call for:

- tighter controls on sprawl;
- better allocation of the cost of servicing to new development;
- more infill development;
- more high-density development;
- the various department staffs to work together to better define the intent of the policies and thereby make them easier to implement;
- better coordination of transit planning with RT and other county entities responsible for transportation planning; and
- review of and, where warranted, revisions to the TOD guidelines to reflect the current urban landscape within the county.

On a positive note, the County is beginning to see a change in the public's perception of transit. The County is served by the Capital Corridor train (i.e. commuter rail). The reasonably priced service (e.g. \$108 for a monthly pass) operates in a corridor stretching from 40 miles east of Sacramento to San Jose. Service levels range from one train per day to ten trains per day. Ridership in the north has grown substantially. The service now has a revenue-to-cost ratio of 33 percent.

It is worth noting that Sacramento County heavily subsidizes the use of transit, either directly or through disincentives for other modes. Parking is very expensive in the core areas and its availability is limited.

4.2 City of Rockville, Maryland

Rockville is an affluent suburban city of approximately 50,000 people with a workforce of approximately 57,000. It is the second largest city in Maryland and county seat of Montgomery County. It occupies 1,303 square miles within the Metropolitan Washington, D.C. area and is located 12 miles northwest of the nation's capital.

The City is currently experiencing high levels of congestion. Congestion is getting worse, accessibility by automobile is declining and there is no expectation that the situation is going to get better given the current under-funding of roads. The City is using a transit-oriented development approach to focus on the integration of land use and transportation requirements and to encourage increased use of alternative modes of travel.

The City does not have a public facilities ordinance that mandates concurrency such is the case in many parts of the United States. Rockville is achieving its objectives with the support of its elected officials. They are very understanding and highly supportive of the need to achieve increased use of alternative modes of travel other than the single-occupant automobile.

The City is using the concept planning stage to ensure road rights-of-way are appropriate and adequate to accommodate transit routes and bike facilities, and that bus stops are integrated into planned developments. Rockville has had a lot of success getting transit stops integrated into building designs.

Land use patterns that are supportive of alternative modes to the single-occupant automobile are mandated. In addition to the land use requirements, Rockville has requirements for new office developments that include:

- ~ provision of 5 percent of parking spaces for carpools;
- ~ provision of bike lockers; and
- ~ an annual fee in the first ten years after development of ten cents per sq. ft. for the City's Travel Demand Management (TDM) program.

The City operates the TDM program on a Citywide basis and uses the fees that are collected to finance the operation of shuttle services and so forth.

The City of Rockville has a Standard Traffic Methodology for new developments that are proposed. Traditionally, the Standard Traffic Methodology has been used to identify road requirements associated with proposed development. The City is starting to expand the standard requirements of the traffic methodology beyond roads to include mitigation measures.

At the zoning level, the City is implementing designs that:

- ~ face the street;
- ~ put parking in the behind buildings, away from the street; and
- ~ give priority to alternative modes.

Traditional setback requirements are being revisited and revised to reflect current thinking and be more supportive of transit.

The City is not having difficulty implementing transit-supportive measures, despite the lack of a public facilities ordinance because of the political support staff receives. The City has been able to convince developers of the need for alternative modes using a marketability argument. The City's position is that accessibility by automobile is declining and will continue to get worse because there is no commitment to funding road improvements. As accessibility declines, developments in the area will become less attractive to potential home buyers and land values will decline as demand decreases.

The City is telling developers that they have an option to provide measures that will support the use of alternative modes of travel. The developers are generally supportive of the approach. Developers will do what it takes to get approvals and recognize that the requirements are not costly.

The City has some large developments that are proceeding in rural areas.

The City annexed an area and approved a concept plan about 3 years ago that is located at the planned terminus of the Metro line into downtown Washington, D.C. The plan includes approximately 3,200 dwelling units and 3 million sq. ft. of office development. The County plan and master plan includes a light rail extension. Mixed use, higher density development is planned around rail stations to maximize the City's transit-oriented goals.

The City has another planned development covering over 250 acres and comprising approximately 1,800 dwelling units and up to one million sq. ft. of commercial space. The proponent of the Fallsgrove Concept Plan is following a transit-oriented development approach.

The policies drafted in support of the concept require:

- ~ pedestrian ways and bikeways connected to the City's overall bikeway and pedestrian system;
- ~ a multi-modal transportation centre located adjacent the Fallsgrove village square and community retail centre for the coordination of local and express bus service in the area, Metrorail shuttle service, carpools, vanpools, and bike storage;
- ~ building orientation and design geared towards pedestrians;
- ~ bicycle parking facilities at all multi-family, commercial and retail facilities as well as at any community facilities;

- specifically designated, reserved parking spaces for carpools and vanpools at all office buildings at Fallsgrove;
- employee shower facilities in all office and research and development buildings in excess of 150,000 sq. ft.;
- a bus stop shelter at each multi-family complex and office building;
- payment to the City of 10 cents per sq. ft. of retail, office and research and development space and 60 dollars per multi-family dwelling each year for a 10-year period, less credit for the initial capital cost of the design and construction of the multi-modal centre (approximately \$300,000), as a major component of Travel Demand Management (TDM);
- that the transportation centre provide office space up to 500 sq. ft. for a TMD manager, if the City or Montgomery County establish a Transportation Management District for the Shady Grove area and hire a manager for the TMD;
- a *Live Near Your Work* program modeled after the State of Maryland's program that allocates a portion of its TDM payment to housing discounts/subsidies; and
- one business centre (telework centre) for the use of multi-family residents in one of the multi-family communities.

Most of the City's development comprises redevelopment of existing sites (i.e., approximately 70 percent). The City has several traditional office campuses that are being redeveloped at higher densities. Most of the difficulty in implementing transit-supportive development that is experienced by the City relates to retrofit situations. It is difficult to retrofit transit routes and bike facilities in many of these instances. In retrofit situations, proposals are considered case by case based on the proposed use.

The City has an aggressive parks and recreation division that is responsible for implementing the City's bike network.

The City works closely with the County and the City and County have a common vision. Generally, the only conflicts that arise are related to financial matters and prioritization of improvements.

The City is in the process of implementing transit-oriented development, so there is no evidence of any shift from automobiles to alternative modes at this time. It is anticipated that it will be five years before the City sees any evidence of the shift away from reliance on the automobile.

4.3 City of Vancouver, Washington

Vancouver, Washington comprises approximately 45 square miles on the north bank of the Columbia River, directly across from Portland, Oregon. The estimated population of the City of Vancouver is approximately 135,000.

All counties within the state of Washington with populations of 200,000 or more engage in transportation demand management planning. Counties and cities are required to develop regionally-coordinated commute trip reduction plan with an initial emphasis on requiring major employers within affected cities and counties to develop programs intended to accomplish commute trip reduction by employees. Concurrency requires that adequate transportation capacity be available to support development. A proposed development may not proceed if it would lower the level of service (LOS) of a transportation facility below the adopted standard. Transportation improvements that would bring the LOS back to the adopted standard must be reasonably funded and scheduled for completion within six years.

The City of Vancouver is intent on becoming a more densely populated community, reliant on public transportation, rather than a suburb spread out across the landscape. The City is using a TOD approach to achieve its objectives.

The City of Vancouver has a Comprehensive Plan that supports increased use of transit as well as Neighbourhood Action Plans (NAP) that deal with specific neighbourhood issues. However, the key to the City's approach is Vancouver Municipal Code - Title 20 - Zoning Ordinance. Chapter 20.95, Transit Overlay District.

The purpose of the Transit Overlay District is to improve mobility by providing for pedestrian and transit-friendly development through a mix of residential, commercial and employment opportunities that focus appropriate densities and design characteristics within the designated transit corridors. Specifically, the Transit Overlay District is intended to:

- ~ carry out the goals and objectives of the Community Framework plan and the Vancouver Urban Area Comprehensive Plan;
- ~ provide densities that encourage mixed-use development within the transit corridor and support multi-modal transportation facilities including high-capacity transit;
- ~ encourage infill and reinvestment in the urban area while adding to the quality of life;
- ~ create safe, attractive and convenient access for transit users, pedestrians, bicyclists and others through building and site design;
- ~ reduce conflicts between pedestrians, bicyclists and vehicles;
- ~ reduce automobile trips and reliance on the single-occupant vehicle by discouraging auto-oriented uses and encouraging alternative modes of transportation;
- ~ promote livability, commerce and neighbourhood vitality;
- ~ reinforce public investments with private development;
- ~ provide for transit overlay concepts while reflecting market forces;
- ~ target overlay concepts to different areas within the Transit Overlay District;
- ~ promote land use patterns and designs identified through the Visual Preference Survey process; and

- provide a voluntary and incentive-based ordinance that both encourages pedestrian and transit-oriented design elements and furnishes flexibility.

The provisions of the Transit Overlay District ordinance may be applied only to parcels located within the boundaries of the designated Transit Overlay District. These provisions establish densities and development regulations applicable to all developments in the Transit Overlay District but also provide for separate standards for different development environments. These development environments are designated as Tier 1 and Tier 2. The Tier 1 environment is oriented towards higher densities and more transit-friendly urban design that could be associated with high-capacity transit or increased transit service. Development within Tier 2 is encouraged at increased densities and is subject to certain development regulations, at a less restrictive level, that will also encourage the use of alternative transportation modes, and pedestrian and transit-friendly development.

The provisions include regulation of densities, uses, pedestrian access, landscaping, building orientation, setbacks, and parking. The provisions of the Transit Overlay District also provide for incentives to encourage development including transportation impact fee reductions, density bonuses, parking reductions, development charge reductions and an expedited development review process.

The advantage of this approach is that developers within the Transit Overlay District are provided a significant amount of incentives if their development is transit-oriented. Without incentives, many jurisdictions find that it is difficult to implement their plans.

A distinct disadvantage of the Transit Overlay District provisions is that they are voluntary. Therefore, the city is reliant on developer interest in achieving transit-oriented developments. Another drawback of the Transit Overlay District is that the provisions are not city-wide, and thus apply to limited areas. This means that there is little incentive for developers outside of the Transit Overlay District to propose a transit-oriented development.

4.4 City of San Diego, California

The City of San Diego has a population of over 1.2 million people and employment level of 650,000 jobs.

The San Diego Association of Governments (SANDAG) comprises the region's cities and the County. The region has a population of approximately 2.8 million people and employment level of 1.1 million jobs. SANDAG has developed a regional Growth Management Strategy that calls for increased development in transit focus areas and decreased development intensity in areas not served by transit.

The Metropolitan Transit Development Board (MTDB) serves as the policy-setting and overall coordinating agency for public transportation in the San Diego metropolitan area. It has jurisdiction over an area of approximately 1,476 sq. km. and serves a population of 1.8 million. The MTDB is the agency that planned and built San Diego's light rail transit

system and the San Diego Trolleys. MTDB also oversees the operation of the region's bus service and coordinates the interaction between buses and trolleys.

The City of San Diego is a willing partner in the support of transit-oriented development, as well as transit-friendly design. The City's Mobility Program comprises:

- ~ Transit Management to improve the public transportation system;
- ~ Transportation Systems Management to increase capacity and ease congestion through operational improvements to the street and highway system; and
- ~ Transportation Demand Management (TDM) to reduce transportation demand through modified travel behaviour and land development policies that reduce automobile dependence. Land Guidance is part of the TDM program.

The City of San Diego believes that:

- ~ land use patterns and transit development should be mutually supportive;
- ~ public transit must play an increasingly important role in San Diego's total transportation system;
- ~ it is imperative that a strengthened transit consciousness be fostered on the part of local public planners, administrators, and elected officials, as well as the general public; and
- ~ it is vital that the financing and development of future needed public transit facilities and services be accelerated to the extent that it can reasonably be accomplished.

The primary planning tools used by the City include:

- ~ Council Policy 600-34, Transit Planning and Development;
- ~ Council Policy 600-39, Land Guidance; and
- ~ zoning code amendments to create transit and pedestrian-friendly standards.

Council Policy 600-34, Transit Planning and Development, requires that Council work closely with MTDB in planning for, and implementing the development of, public transit in the San Diego area. More specifically, it states that the City will pursue specified implementing measures in the areas of planning; right-of-way protection and acquisition; and the funding of guideway and facility construction, operation, and maintenance. Specified implementation measures relate to:

- ~ making transit an integral component of all major planning studies and programs;
- ~ ensuring that existing and proposed transit corridors are clearly depicted on the General Plan's land use, transportation, and urban design elements and maps, and that land use and development intensity recommendations are incorporated into the General Plan to reinforce the use and effectiveness of identified transit corridors; and
- ~ ensuring recommendations for transit routes and stations are identified in all community plans.

Council Policy 600-39, Land Guidance, commits the City to the pursuit of an urban form that includes a pedestrian-oriented, mixed-use multi-modal transportation environment. More specifically, the policy commits the City to incorporating TOD guidelines into its Progress Guide and General Plan policies, community plan policies, demonstration projects, discretionary project permits, municipal code standards and enabling ordinances, street design guidelines and facilities financing policies.

The policy also provides guidance with respect to implementing TOD planning principles, including:

- ~ high priority TOD opportunity areas should be mapped and identified in the Progress Guide and General Plan;
- ~ the City should take a proactive approach to designating transit corridors, planning for mixed-use and transit-supportive land uses, and incorporating transit-supportive urban design guidelines into community plans;
- ~ the Street Design Manual should be updated to introduce greater flexibility into the guidelines to allow, in appropriate locations, development in accordance with TOD principles that promote a network of: interconnected streets; non-motorized access passages; variable street widths and configurations for local streets; increased sidewalk widths; business and residential-serving alleys; and widespread use of street trees within mixed-use, transit-oriented areas while still providing adequate sight distances;
- ~ the City should encourage proposed projects fully or partially located within 2000 feet of an existing or planned Light Rail Transit, commuter rail, express bus or transit corridor stop as identified on Council-approved transit alignment maps to incorporate elements of the Transit-Oriented Development Design Guidelines into project designs;
- ~ the City should encourage private investment in TOD projects by supporting a package of incentives that could address permit processing, environmental review, and fee deferrals or reductions; and
- ~ in recognition of the cumulative fiscal benefit resulting from a more efficient urban form, fees for projects developed as TODs in General Plan identified TOD opportunity areas should be reduced.

Zoning regulations are provided in support of the broad level policies and offer an effective way to achieve transit-supportive development over time. Key components of new codes adopted in the City of San Diego relate to:

- ~ creating Urban Village Overlay Zones that will allow for greater variety of uses, flexibility in site planning and development regulations, and intensity of land use than is generally permitted in other city-wide zones;
- ~ creating Transit Area Overlay Zones identifying areas with reduced parking demand and lower off-street parking requirements.

- revised parking standards allowing parking reductions of 10 to 20 percent for multi-family dwelling units and approximately 15 percent for most commercial uses located in transit areas; and
- permitting attached and detached single dwelling units on smaller lots than are required in the standard single-family zones.

The Metropolitan Transit Development Board also plays a key role in supporting increased transit use in the City of San Diego. MTDB has taken a very proactive approach in encouraging joint development projects to integrate transit developments to meet community needs, and promote and enhance the use of public transportation. The MTDB has also been proactive in providing guidance with respect to designing for transit. The MTDB's *Designing for Transit: A Manual for Integrating Public Transportation and Land Development in the San Diego Metropolitan Area* is typical of suburban transit-friendly design guidelines.

The City of San Diego has had success in implementing transit-oriented development as a result of:

- articulating its goals and establish a solid foundation of transit policies and complementary regulations;
- creating numerous partnerships and continually looking for opportunities to implement policies;
- being persistent over time, and
- implementing projects incrementally rather than as a part of a single major initiative.

4.5 Snohomish County, Washington

The County of Snohomish has a long history of involvement in transit-friendly design and is supportive of several aspects of transit-oriented development.

Snohomish County is a largely rural county north of Seattle, Washington. Snohomish County began to focus on the relationship between land use and public transportation back in the mid- 1980s. The process was initiated by planning staff of the Snohomish County Transportation Authority (SNO-TRAN) in response to evolving needs of planning and federal funding agencies. Staff recognized the need to develop the land use/public transportation relationship. SNO-TRAN developed *A Guide to Land Use and Public Transportation for Snohomish County, Washington*. The document raised awareness of the importance of land use in supporting increased transit use but was never fully implemented.

Snohomish County has two local transit operators; City of Everett Transit and Community Transit. SNO-TRAN no longer exists and has been replaced by SoundTransit. SoundTransit is the regional transit authority responsible for service planning and coordination and the administration of federal funding in Kings, Pierce and

Snohomish Counties. Sound Transit receives annual funding from car licensing in the region.

The state of Washington has a Growth Management Act requiring multi-county policies for managing urban growth. The key policy document for the region is the Puget Sound Regional Council VISION 2020. The central Puget Sound region adopted VISION 2020 in 1990 as the region's first integrated long-range growth and transportation strategy. The strategy supports transit and transit-oriented development in many of its policies. The document puts forth a vision and policies based on a centres and corridors plan for the central Puget Sound region encompassing King, Kitsap, Pierce and Snohomish counties. It combines a public commitment to a growth management vision with the transportation investments and programs and economic strategy necessary to support that vision.⁷

Metropolitan Transportation Plan (MTP) provides the more explicit transportation component of VISION 2020. It defines long-term transportation strategies and investments for the Metropolitan Transportation System of the central Puget Sound region.

The VISION 2020 and the Metropolitan Transportation Plan strategy can be stated as:

- improve efficiency through effective transportation management;
- use transportation demand management measures to reduce travel demand, provide new sources of revenue, and help meet environmental objectives;
- focus transportation investments to support transit and pedestrian-oriented land use patterns; and
- add transportation capacity where appropriate to provide alternatives to automobile travel, enhance safety and access, and improve freight and goods mobility.

VISION 2020 contains numerous policies related to:

- identifying and maintaining urban growth areas;
- supporting compact communities;
- focusing growth in centres;
- encouraging the location and timing of growth within urban growth areas to support development of centres and use of existing service and facility capacity;
- providing services in a coordinated and effective manner;
- coordinating planning and implementation activities to achieve consistency;
- establishing a coordinated multi-modal transportation system that is integrated with and supported by region-wide growth management objectives;
- identifying urban centres as the focal points of activity, connected to other centres by frequent and fast high-capacity transit; and

- shifting the emphasis of transportation improvements from highways and single-occupant vehicle travel to travel options that support the movement of people and goods by focusing on transportation facility improvements, as well as on influencing the operating environment in which travel choices are made.

VISION 2020 recognizes that many of the policies will be implemented through local comprehensive plans as well as transit agency and state transportation plans.

Implementation of the vision was to include light rail extensions to Snohomish County that would connect its major cities with others in King and Pierce Counties, including Seattle. The planned light rail extensions were part of a \$6 billion proposal that was to be initiated by SoundTransit but was defeated in a public referendum.

The County's comprehensive plan draws upon and is consistent with the policies of *Vision 2020*. The original SNO-TRANS concept of transit-oriented development is promoted in the County's plan. The County land use map shows future land use centres throughout the region.

However, the plan is not being implemented. One of the problems has been the lack of consistency between the plan and the provisions of the zoning code. The County is completing a Centres Study that is examining the potential for higher density, mixed use nodes of approximately 1/4 mile. As part of the study, the County is developing revised Code and incentives and disincentives that will help implement the planned centres.

Title 26(b) of the Code permits the collection of traffic impact fees for new development. The County is now expanding the scope of improvements beyond traditional road requirements to include the collection of fees for travel reduction items such as Travel Demand Management (TDM) initiatives.

Another key issue is that the high-capacity light rail system planned for the area is not being implemented. This is largely a funding issue.

The County views concurrency as a fundamental problem when trying to implement transit supportiveness. The County has a traffic impact ordinance that effectively allows lower development densities, as long as a traffic impact study can demonstrate that the traffic generated by development can be accommodated at current service levels. The traffic impact studies always demonstrate that levels of service will be acceptable. As a consequence of the concurrency approach, the County is never in a position to force higher development levels.

4.6 City of Calgary, Alberta

The population of the City of Calgary is over 820,000 people. Just over half the population lives in suburban communities within the City. New growth in the City continues to occur predominately in new suburban communities.

Transit services in the City of Calgary are provided by Calgary Transit, which is responsible for all aspects of transit service. Calgary Transit's fleet consists of buses on 160 regular routes and light rail vehicles operating on three lines. The transit system

accommodates in excess of 102 million boardings a year, with an annual passenger revenue of nearly \$71 million.

Calgary's objective is to make public transit an important determinant of new subdivision design by introducing transit-friendly design considerations into the planning and development process as early as possible. The location of major transit corridors and the phasing of major transportation improvements are identified early in the planning process under the comprehensive framework of a Growth Management Plan (GMP). Growth Management Plans are a level of strategic planning between the General Municipal Plan and the Community Plan for growth areas in the city.

Calgary has a solid transportation policy framework in supportive of the use of alternative modes. The three major initiatives that support transit use are:

- ~ Calgary Transportation Plan;
- ~ Sustainable Suburbs Study; and
- ~ Transit Friendly Design Guide.

The Calgary Transportation Plan is the product of the GO Plan exercise that culminated in 1995. The planning exercise was a reaction to environmental concerns raised regarding additional bridge crossings being proposed in the northwest section of the City. Through the study process, it was shown that the additional bridge crossings could be avoided with the implementation of:

- ~ different land use pattern; and
- ~ alternative modes of travel.

The Calgary Transportation Plan is a comprehensive long-range transportation plan approved by City Council. The plan emphasizes the role of public transit and the reduction of vehicle trips. The plan recognizes that the transit network is closely linked with land use and changes to travel behaviour and that effective land use planning and design is essential to make transit attractive and viable. One of the key objectives of the plan is to increase the number of jobs located close to where people live.

In new suburban locations, the key policy document is the Sustainable Suburbs Study. This study came out of the GO Plan exercise and presents a number of policies related to the major components of a sustainable community, including mixed-use activity centres, open space, housing, transportation and environmental issues. It is the key document in terms of implementing the Transportation Plan and provides the framework for preparing community plans and evaluating plans for new suburban development.

The Sustainable Suburbs Study was completed for four reasons:

- ~ to implement the Calgary Transportation Plan;
- ~ to control the costs of growth;
- ~ to better meet people's needs; and
- ~ to encourage more sustainable lifestyles.

The Study recommends moving away from largely single-purpose, low-density residential areas to communities designed along the lines of an urban village. There is no intent to impose a single design approach. Instead, the Study outlines Acceptable Performance Criteria, which provide guidance to the approval authority when reviewing plans.

With respect to transit-supportive development, the plan suggested that for implementation to occur, the City needed to develop new street design standards. This recommendation led to the Transit Friendly Design Guide.

The Transit Friendly Design Guide contains principles and policies for transit-supportive development and identifies techniques for improved integration of transit into residential and non-residential areas to achieve the vision described in the Calgary Transportation Plan. The basic principles of transit-friendly design are:

- ~ provide appropriate community densities;
- ~ minimize walking distance;
- ~ provide mixed land uses;
- ~ organize density, land use and buildings to benefit from transit;
- ~ create a pedestrian-friendly environment;
- ~ route transit into the community;
- ~ reduce transit travel time; and
- ~ build quality, user-friendly transit facilities.

Based on the Guide, new suburbs are required to achieve overall densities in the range of 6 to 8 units per acre (upa).

Implementation of the transit-supportive land use is an ongoing problem for the City of Calgary. The land use that is envisioned by the Calgary Transportation Plan has not materialized. The employment centres that are designated have been very slow to develop. The market just does not exist.

The City of Calgary is being proactive in attempting to initiate development in the designated employment centres and increasing the use of alternative modes.

The City has completed an employment study and is looking to facilitate development at key locations through joint development efforts. The City, through its transportation project office, is attempting to identify and facilitate development of surplus City lands adjacent stations on the planned light rail transit (LRT) extensions. They are currently in the process of defining commuter parking demand and requirements as part of the determination of surplus lands.

The City currently sponsors a program known as "Escape the Rush". The program aims to educate the public in hopes of spreading the peak travel period and increasing the use of alternative modes.

In the Centre Street corridor, construction on the Centre Street bridge has closed the bridge to traffic. Calgary Transit has continued to operate across the bridge using a single lane. The lane reverses direction based on the peak hour, peak direction of travel. The transit service has proven successful during the period of construction. Calgary Transit is attempting to have a permanent HOV lane made part of the reconstructed cross-section.

Mackenzie Towne, a new suburb based on new urbanist planning principles, is doing well in terms of marketing. It is being built-out at 6-7 upa. It has a more rigid grid network of streets but is really a hybrid community.

In terms of an assessment of policy, the downtown work transit modal split has increased from 39 percent to 42 percent in the last three years and overall transit use is up 2 percent. This could be largely attributable to the fact that the road network in Calgary is at capacity during the peak hours. The City is starting to see a spreading of the peak travel periods.

Realization of the designated employment centres is seen as the biggest problem. The employment centres are the basis for shifting travel patterns. General solutions to the implementation problems faced by Calgary could include City-led development in designated employment centres, decentralization of the City workforce to designated employment centres and tax incentives for transit users.

4.7 Town of Markham, Ontario

The Town of Markham is a suburban municipality with a population of over 180,000 people and employment of approximately 100,000 jobs. Markham is part of the Greater Toronto Area and is located northeast of the City of Toronto.

The Town of Markham operates nine local bus routes. Six additional bus routes are operated between Markham and the City of Toronto by the Toronto Transit Commission (TTC). Bus routes operated by Markham Transit and the TTC carried nearly 2.8 million riders in 1996. The Town is also served by the Greater Toronto Area Transit Authority (i.e., GO Transit) which operates both bus and commuter rail services in the region. Available information indicates that GO Transit carries an additional 2,750 annual trips originating in Markham. The majority of transit riders are destined to Toronto.

The Town has adopted traditional neighbourhood design planning principles in its urban growth areas and presently has several TND projects under construction. The Town of Markham has become well known as a result of its commitment to TND principles however, the Town's planning approach does not have a transit-supportive land use focus. The focus of the Town's policies is community design. Nonetheless, the planning approach is generally transit-supportive.

The Town's Official Plan Amendment No. 5 (OPA 5) setting the current limits of the urban expansion area, established a target housing mix, a town centre and started to remove the separation of uses that had traditionally been adopted in the Town. The Town also completed a town-wide transportation study in 1994 (i.e., Town of Markham

Transportation Planning Study - MTPS) that is very supportive of increased transit use. The MTPS establishes target transit splits and infrastructure requirements based on a land use pattern of high-density nodes and corridors.

All of the Town's policy direction pertaining to increased transit is provided through the secondary plans that are prepared for the planning districts in the Town. The Town's secondary plans for areas in the urban expansion area such as the Cornell, Wismer, Berczy and Angus Glen communities include a Community Amenity Area (CAA) land use designation. This new CAA designation provides for mixed-use, higher density land use. The CAA designation is proposed along the major collector road through the urban expansion area and is intended to support planned higher frequency transit in the corridor.

The Town is also insisting on a highly connected grid of streets that supports the planned routing of transit in the urban expansion area.

The existing Thornhill community and the planned town centre are the primary areas the Town is focusing on in terms of transit supportiveness. The Town is promoting development of higher density, mixed use nodes in these areas. An existing GO Transit commuter rail station is a focal point of the town centre plan.

The Town's land use policies are implemented through its zoning. The Town is zoning land uses and densities that are supportive of transit.

To-date, there has been limited implementation of the mix of uses and higher densities that are planned. The CAA designation is being implemented entirely as residential uses (i.e. street townhouses) since employment uses are permitted rather than mandatory. This is primarily a reflection of the market conditions in the Greater Toronto Area. The Town believes that there is a possibility of achieving some live/work opportunities.

The Town also requires phasing plans for new developments. The phasing plans are intended to be a mechanism that would provide the Town with some control over the transportation requirements needed to support new development. In reality, phasing has tended to be driven by servicing and road requirements.

One of the problems that the Town of Markham has is that the recommendations of the transportation study have never been incorporated into the Town's Official Plan. As a consequence, there is no town-wide policy statement regarding transit. Town planning staff feel that perhaps the Town's vision of transportation as stated in the Markham Transportation Planning Study should be incorporated into the Town's Official Plan.

That said, it is not anticipated that the Town will become any more aggressive in terms of supporting transit. Markham is doing quite well in terms of overall transit modal split, relative to other suburban municipalities in the Greater Toronto Area (e.g. Vaughan).

The problems the Town faces are related to implementation of transit-supportive land use and measures. The housing market in Markham does not support the type of development that is needed to support higher transit use.

Furthermore, the Town cannot afford to operate increased transit services. The recent downloading of provincial funding responsibilities to the local municipalities is a major cause of the problem. So far, the municipality has not found a way to put more money

into local transit. As a consequence of the additional financial responsibilities that have been given to the local municipality, transit priorities are slipping. The Town does not anticipate that transit will be a priority at the local level within the current context.

The Town feels that transit needs to be the responsibility of senior government in order to coordinate and finance required services.

5. Model Policy Wording

The intent of this research project was to develop model policy wording that might be used in suburban locations based on the experiences and successes of suburban municipalities and jurisdictions that are presently following a transit-supportive land use planning approach.

In developing model policy wording, there is recognition that land use and transit measures can be applied at a variety of different planning levels from regional to neighbourhood to a transit station site and that the requirements for success vary depending on the planning context. However, the review of transit-supportive land use planning approaches serves to emphasize the high level of inter-relatedness between many of the approaches. There are clearly elements of transit-supportiveness that are common to most, if not all, of the land use planning approaches.

Examples of land use policies that support transit use in a suburban context are identified in the following sections of this chapter. These policies represent a sample of the kinds of land use policies that are being implemented in an effort to increase suburban transit use. One needs to review the available literature to appreciate the full extent of the policies that exist.

The policies are categorized on the basis of the planning approach most relevant in the municipality or jurisdiction where they originate. It is apparent from the research that land use policies should be developed in the context of an individual municipality's particular situation to meet its specific goals for transit without being overly concerned about the land use planning approach that is advocated. The theme of supporting transit use that is common to all the approaches means that the land use policies are often similar, and almost always complementary.

5.1 Transit-Oriented Development

Transit-oriented development is characterized by the concentration of jobs, moderate and high-density housing, retail uses and services, and complementary public uses in mixed-use developments at strategic points along an area transit system. Regional or upper tier municipal land use policies most often focus on promoting increased transit use, creating the structure of transit nodes and corridors, and encouraging local governments to designate suitable development in those nodes and corridors. Examples include:

- Local jurisdictions that are or will be directly served by the high-capacity transit system identified in the Metropolitan Transportation Plan should develop specific

station area plans as part of their comprehensive planning efforts that provide for development, services and facilities sufficient to support efficient transit service commensurate with the regional investment in transit. Local station area plans should be consistent with regional high-capacity transit station area guidelines, and at a minimum address land use and density, transit-supportive development regulations, urban design, parking, and non-motorized access.

- ~ Encourage development patterns and policies that discourage long distance automobile commuting and increase resident access to employment, shopping and recreation by transit or non-auto modes.
- ~ Increase transit use by encouraging intensive developments to locate within easy access to existing or planned high-order transit.
- ~ Create and maintain a structure of centres and corridors through reurbanization that concentrates population in areas well served by transit and promotes use of transit.
- ~ High-density transit-oriented development should be planned along existing and planned fixed transit corridors and designed to make the use of public transportation more attractive.
- ~ Promote the development of new communities along transit corridors where interurban transit service and capacity are available or committed.
- ~ Encourage local governments to use zoning and land development techniques to create higher density mixed uses around committed rapid transit stations.

TOD

Examples of land use policies of local jurisdictions that promote transit-oriented development in a suburban context include:

- ~ Within the commercial transit corridor, the area adjacent to and within 1/4 mile of the transit street shall be developed as a mixed use area with commercial, office, civic uses and residential uses.
- ~ Along the transit corridor, the greatest intensity/density of uses should be in close proximity to the transit street, with less intense/dense uses as a transition between the high intensity corridor and the surrounding low to medium density residential areas.
- ~ Building orientation and design will be geared towards pedestrians. Office buildings will be located as close as possible to roadways, bike paths and sidewalks with parking beside or behind such buildings.
- ~ Residential densities within Neighbourhood TOD (transit-oriented development) sites must be a minimum of 7 units per residential gross acre, an average of at least 12 units per residential gross acre, and a maximum of 30 units per residential gross acres.
- ~ Developments in the areas designated on the Land Use Schedule as TODs shall be designed in a manner that conforms to the concepts of transit-oriented development, including:

- High intensity, mixed use development concentrated in a Core Area within an easy walk (one-quarter mile) of a transit stop on the Trunk or Feeder Line Network.
- An emphasis on neighbourhood support commercial services at street level in the Core Area that can serve the residents of the Core and surrounding Secondary Areas, with other employment encouraged along the Trunk Line Network.
- A pleasant walking environment created through good land use design, short distances, amenities, and streetscape features.
- The design and construction of a multi-modal transportation centre located adjacent the Core Area/neighbourhood centre is required by the applicant in designated TODs. It will provide a location for the coordination of local and express bus services in the area, a regional transit shuttle service, carpools, vanpools, and bike storage. The centre will have a direct and convenient access to buses, carpools and vanpools via a dedicated turnout area. Pedestrian and bicycle facilities will be oriented towards serving the centre.
- In addition to the multi-modal transportation centre, each multi-family complex and office building will have a bus stop shelter. The design and location of the shelters will be integrated into the comprehensive design and will be located at or near the most prominent entrance to each parcel.
- All office buildings in designated TODs will have specifically designated, reserved parking spaces for carpools and vanpools. Five percent of office and research and development related parking spaces will be carpool spaces provided at preferential, close-in locations.
- As determined at time of Detailed Application, bicycle parking facilities will be provided at all multi-family, commercial and retail facilities as well as at any community facilities.
- Employee shower facilities will be provided in all office and research and development buildings in excess of 150,000 sq. ft.
- Any development within the transit overlay district shall receive a density bonus based on the implementation of five, or more, of the transit or trip reduction actions listed below. These bonuses are in addition to underlying zoning bonuses, if the required criteria are met:
 - construction of direct walkway connection to the nearest arterial;
 - installation of pedestrian-convenient information kiosk, with maintained information;
 - installation of on-site sheltered bus stop or bus stop within 1/4 mile of site with adequate walkways;
 - installation of bike lockers;

- ~ commercial development which would be occupied by employer subject to Commute Trip Reduction Ordinance;
- ~ voluntary compliance with Commute Trip Reduction Ordinance, where compliance is not required;
- ~ connection to existing or future regional bike trail;
- ~ direct walk/bikeway connection to destination activity if residential development, or to origin activity if commercial/retail facility;
- ~ construction of on-site internal walk/bikeway network;
- ~ installation of parking spaces which will become paid parking;
- ~ installation of preferential carpool/vanpool parking facilities;
- ~ development within the transit overlay district; and
- ~ regular distribution of TDM information package to all new tenants.
- ~ Required parking spaces may be reduced at a ratio of one parking space for each 100 sq. ft. of transit amenity space provided above and beyond the minimum required.

TRANSIT-FOCUSED DEVELOPMENT

Specific to transit-focused development, land use policies for promoting and controlling development adjacent transit stations can include:

- ~ Promote the effective use of the transit station development areas and access thereto.
- ~ Provide multiple-family residential densities for use at locations within walking distance of the transit stations.
- ~ Provide a range of densities that will afford planning choices to match the diverse characteristics of the several transit station development areas within the county.
- ~ Promote the optimum use of the transit facilities by assuring the orderly development of land in transit station development areas and access, both vehicular and pedestrian stations.
- ~ Minimize the necessity for automobile transportation by providing, in largely residential transit station areas, the retail commercial uses and professional services that contribute to the self-sufficiency of the community.
- ~ Obtain amenities for the residents and workers in transit station areas not ordinarily obtainable in conventional zoning classifications.

TRANSIT CORRIDOR DISTRICT

Transit corridor districts are another specialized application of the TOD planning approach that warrant unique land use policy wording. There are few examples from the literature but TCD policies may include:

- ~ Encourage transit-sensitive land use design through the designation of Transit Corridor Districts (TCD) that are especially responsive to the use of transit.

- ~ A Transportation Management Association shall be established to oversee transportation services and land use development along the transit corridor.
- ~ Parking requirements in Transit Corridor Districts shall reflect the availability of transit services.
- ~ Promote transit accessible site design in major land developments in Transit Corridor Districts.

5.2 Transit-Friendly Design

Transit-friendly design aims to provide a mix of uses at densities that will support transit, design streets to be pedestrian-oriented, minimize walking distances by providing direct pedestrian connections to transit stops and create street layouts that accommodate transit vehicles in an efficient manner. Examples of land use policies that are being implemented in local planning jurisdictions are provided in this section. These land use policies reflect the policy areas that are most often targeted in support of transit-friendly design:

- ~ To increase population densities, development in all communities must achieve a minimum density of 17.3 units per gross hectare (7 units per gross acre).
- ~ To achieve maximum transit demand, high density development and high activity uses should be located at focal points along transit routes.
- ~ Development should be continuous along both sides of the bus route. Long stretches of undeveloped land that do not generate demand should be avoided.
- ~ Subdivisions are to be laid out to provide safe, convenient, and direct bicycle and pedestrian access to nearby and adjacent residential areas, transit stops, neighbourhood activity centres such as schools and parks, commercial areas, and industrial areas, and to provide safe, convenient, and direct transit circulation.
- ~ Access points at property edges and to adjacent lots shall be coordinated with existing development to provide circulation patterns between developments. Buildings, landscaping, fences, and other improvements shall be located so as not to preclude eventual site-to-site connections.
- ~ Safe, direct, barrier free walkways will be included in community designs to reduce the pedestrian walking distance to transit service. Community design will minimize pedestrian street walking distance to transit service to 400 metres or less.
- ~ To encourage increased community density close to transit service, every effort must be made to include 85% of the area population (dwelling units) within 300 metres street walking distance of transit service (a bus zone or rail station).
- ~ Optimize bicycle access to the transit system.
- ~ Bicycle storage facilities will be provided at all major transit terminals.

- ~ Cul-de-sacs shall be permitted only where there is no feasible connection with an adjacent street. If cul-de-sac streets represent more than 10 percent of the lane miles in a development, the applicant shall be required to demonstrate that alternative internal circulation systems that would minimize cul-de-sacs are not feasible.
- ~ The transit system must be integrated into the community design and be a key component of the community centre, neighbourhood nodes and other community focal points.

5.3 Community Planning

Land use policies that are intended to be transit-supportive do not tend to vary much between the land use planning approaches within the realm of community planning. In fact, the policies are often similar to those of other transit-supportive land use planning approaches, particularly transit-friendly design.

Examples of land use policies that have a distinct sustainability component are suggested in the remainder of this section.

- ~ Promote design that preserves community character and livability, creates lively and people-oriented areas, and supports transit, pedestrian and bicycle access.
- ~ Plan transportation within the Urban Area to support a pattern of mixed use, higher density activity centres and corridors.
- ~ Promote the concentration of high-density residential development in the immediate proximity of major transit corridors and transfer points in the transit system.
- ~ Provide zoning and development incentives along high frequency transit routes and at major transit nodes (terminals) in order to increase employment and population densities along these routes.
- ~ Provide for conveniently located, pedestrian-oriented businesses and services, such as small stores and transit stops, appropriate in scale and character to serve existing neighbourhoods.
- ~ Promote the integration of transit plans into the design of neighbourhood and secondary plans to achieve a distance of approximately 400 metres or a five-minute walk between 90% of residential units and transit stops.
- ~ Support the transformation of low-density auto-oriented transportation corridors to higher-density mixed-use transportation corridors when redevelopment would not detract from centres or compact communities. Corridors that offer potential include those that are located near significant concentrations of residences or employment, and have the potential to support frequent transit service and increased pedestrian activity. Encourage the redevelopment of these arterials through:
 - ~ the addition of transit facilities, pedestrian-oriented retail, offices, housing, and public amenities,

- building design and placement, street improvements, parking standards, and other measures that encourage pedestrian and transit travel, and
- provision of pedestrian and bicycle connections between transportation corridors and nearby neighbourhoods.
- When new development occurs, encourage conversion of large, undeveloped areas in a manner that is pedestrian and transit-supportive, resource-efficient, and that promotes a sense of community. Encourage a diversity of lot sizes and housing types for rental and ownership by people with different needs. Provide a network of connected streets serving transit, pedestrians, bicycles and automobiles that supports efficient travel and connects developing and established areas. Include stores, transit stops and other neighbourhood-oriented uses within walking distance of most residential areas.
- Provide opportunities for the creation of centres in suburban areas that serve as focal points for neighbourhoods and major activity areas, include a mix of land uses, such as pedestrian-oriented commercial, transit stops, recreation and housing, and encourage transit use, biking and walking through design and land use density. Connect and serve centres by a fast and convenient regional transit system. Provide service between centres and nearby areas by an efficient transit-oriented, multi-modal transportation system.
- Encourage development of convenient and safe bicycle routes and footpaths with connections to stores, schools and other activity areas. Improve transportation connections, particularly transit and bike, between nearby communities.
- Integrate land use and transportation planning to encourage health and human services facilities to locate near transit and other services (such as day care, retail and legal) and to promote service delivery at affordable costs.

6. *Conclusions*

There is obvious overlap between the land use planning approaches identified in the literature. This overlap between approaches, in conjunction with the lack of clear definitions for some of these approaches, reinforces the notion that:

- there are elements of transit-supportiveness that are common to most, if not all, of the land use planning approaches; and
- the land use policies attributable to the different approaches are often similar, and almost always complementary.

Most municipalities do not make a conscious decision to adopt one approach or another. Their decision is to support transit and achieve increased transit use within their jurisdiction in the best way possible.

It is evident from the case studies that successful implementation of transit-supportive land use is not always founded on strong land use policies. Alternatively, strong land use policies do not ensure success.

Clearly, successful implementation of transit-supportive land use hinges on a commitment to transit. As indicated at the outset, transit is not the primary focus of several of the land use planning approaches identified in this research paper. Often planning principles support a pattern of development that is conducive to increasing walking and transit use and to reducing dependence on the automobile but to achieve increased use of transit there needs to be a commitment to transit.

In some jurisdictions, the commitment to transit is created through statewide or other legislation mandating local transit-supportive policies and measures as a prerequisite to infrastructure funding. In jurisdictions where there are no such requirements, the commitment to transit can be generated and nurtured through education of politicians, developers and the public and successful implementation of demonstration projects. In other jurisdictions, a commitment to transit-supportive land use planning is only likely when the impacts of continually increasing traffic levels reach crisis proportions.

In those jurisdictions where there is well established land use policy in support of transit, the commitment to transit is evident in the comprehensiveness of the approach and the extent of the transit-supportive policies. Where there is a commitment to transit, the planning approach recognizes the role and benefits of transit, and policies and related planning tools extend beyond land use to address:

- ~ the need for coordination between planning agencies;
- ~ the process of planning and reviewing development and its implementation; and
- ~ financial and other incentives in support of transit.

From the case studies, it appears that the specific wording of land use policies is not a crucial determinant of success. Some jurisdictions have had documented success in implementing transit-supportive suburban land use with policies that are not that well established. In these cases, the commitment to transit is not evident in the land use policies but lies elsewhere. These jurisdictions are successful because they demonstrate:

- ~ the political will to get transit-supportive land use implemented;
- ~ there is market or developer interest in implementing land use that is supportive of transit; or
- ~ creativity in implementing transit-supportive land use.

Just as some jurisdictions enjoy success without extensive land use policies, others fail in implementing transit-supportive land use, despite having extensive transit-supportive land use policies, due to:

- ~ unfavourable market forces;
- ~ inadequate funding; and/or
- ~ lack of political commitment.

7. Notes

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- ¹ Calthorpe Associates, Design for Efficient Suburban Activity Centers, Washington: US Department of Transportation, 1997, p. 13.
 - ² Design for Efficient Suburban Activity Centers, Washington: US Department of Transportation, p. 4.
 - ³ Douglas R. Porter, TCRP Synthesis 20, Transit-Focused Development, Washington: Transportation Research Board, National Research Council, 1997, p.1.
 - ⁴ Guidelines for Transit-Sensitive Land Use Design, Washington: US Department of Transportation, 1991, p. 13.
 - ⁵ The Routes to Future Growth: Fostering Transit-Oriented Development in Northeastern Illinois, RTA, 1995, p. 3.
 - ⁶ Gerald Hodge, Planning Canadian Communities, Toronto: Methuen Publications, 1986, p. 244.
 - ⁷ Vision 2020, 1995 Update adopted May 25, 1995 by Puget Sound Regional Council, p. 1.

8. Glossary

Activity Corridors: Areas of street-oriented uses which incorporate a mix of retail, employment and residential uses, developed at medium densities, located along arterial or collector roads serving as major transit routes. Such corridors may form the boundaries of residential subdivisions or neighbourhoods, but should act as a linear focus for activities and uses within the community.

Activity Nodes: Compact, transit-oriented, pedestrian-friendly areas where the highest concentrations of residential, employment, retail and other uses in the urban area are located. Activity nodes are generally located at points where two or more transit routes or travel modes intersect.

Arterial Road: Major traffic and transit route, intended to carry large volumes of vehicular traffic. Arterial roads should provide continuous routes across urban areas.

Car/Van Pool: A group of people who share the use and costs of a van or car for transportation to and from a destination on a regular basis.

Collector Road: Traffic and transit routes designed to carry lower volumes of traffic than arterial roads, and providing continuous access across neighbourhoods.

Commuter Rail: A rail service usually using heavy rail vehicles, connecting the outlying suburbs and a central business district. Service is generally limited to longer distances (15 to 25 miles) and peak period, home-based work trips.

Comprehensive Plan: A city or county's plan for land use, housing, transportation, capital facilities, open space and other issues affecting the physical development of a community.

Concurrency: The requirement that adequate transportation capacity be available to support development. A proposed development may not proceed if it would lower the level of service (LOS) of a transportation facility below the adopted standard. Transportation improvements that would bring the LOS back to the adopted standard must be reasonably funded and scheduled for completion within six years.

Density Bonuses: Provisions in development regulations that exchange greater floor space or more housing per acre for certain public amenities.

Density: High, Medium, Low: Because these guidelines are intended for use in a variety of municipalities of different sizes, the terms "high", "medium" and "low" density are used in a conceptual sense and must be considered in the context of the prevailing development densities and building heights within a municipality. Generally, low density development refers to detached single-family residential development, or the low-rise commercial or industrial development densities usually found in auto-oriented industrial parks or along highway-commercial strips; medium density development refers to low-rise multi-family residential development or low-rise commercial/residential development usually found along a pedestrian-oriented "Main Street"; and high density development refers to the more concentrated development patterns typically found in the centres of urban areas.

Development Impact Fees or Development Charges: Fees collected for new development that are used to construct traffic improvements to accommodate the additional vehicular traffic generated by new development.

Ecological Sustainability: Is based on principles of ecology that recognize the connectedness and inter-relationship of all living things. Long-term survival (sustainability) of any species in an ecosystem depends on a limited resource base. A sustainable society is one that is able to satisfy its needs while maintaining its natural resources and life support systems.

Feeder Service: Bus services providing connections with other bus or rail transit services.

Fixed-Route Service: Transportation service operated over a set route on a regular schedule.

Floor Space Index (FSI): The ratio of the gross floor area of a building or buildings to the gross area of the lot on which the building or buildings are located. A floor space index (FSI) of 2.0 would indicate that the gross floor area of a building could be up to 2 times the gross area of the lot on which it is located.

Gross Floor Area (GFA): The total floor area of a building, including areas devoted to utilities, stairs, etc. in addition to the net floor area which is directly occupied by owners or tenants.

Headway: The frequency of transit service along a given route.

Heavy Rail: A rail system that operates on a completely grade-separated right-of-way. Generally trains operate longer distances, with limited stops, and in heavily-populated urban corridors.

High-Capacity Transit (HCT): Transportation systems designed to carry large numbers of riders at faster than average speeds. Examples include express bus, passenger-only ferries, and rail.

High Occupancy Vehicle (HOV): A vehicle carrying two or more individuals. HOVs are encouraged as a means of decreasing Vehicle Miles Traveled (VMT). Dedication of highway lanes for HOVs during peak traffic hours encourages carpooling and transit use.

High Occupancy Vehicle (HOV) Lanes: Special lanes designated for the exclusive or near exclusive use of High Occupancy Vehicles. HOV lanes may be located in the median or curb lanes of the street, where roadways are sufficiently wide; existing lanes can be designated HOV lanes on a full-time basis, or may be limited to peak travel periods of the day. Bicycles may also be permitted on HOV lanes in some instances.

Integrated Transportation System: A concept to expand mobility and provide transportation choices by integrating transportation facilities and services appropriate to the land uses in an area (e.g., putting HOV lanes on transit-accessible roads serving high density developments).

Joint Development Agreement: A shared effort on the part of two or more parties to develop a piece of property. In terms of transit, this often involves a private developer and a transit agency. The development may include parking, commercial uses, retail

and/or residential uses. In return of the provision of the property, the transit agency may receive a new or improved station facility, additional joint-use parking, the added ridership generated by the development, infrastructure improvements, or income.

Level of Service (LOS): A qualitative measure describing operational conditions within a traffic stream in terms of speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Level A denotes the best traffic conditions while Level F indicates the worst.

Light Rail Transit (LRT): A rail system that can operate on a variety of rights-of-way, ranging from on-street to grade-separated. Vehicles run on rails and consist of shorter train units than heavy rail.

Local Road: Road designed to carry low traffic volumes, at low speeds, which are intended primarily to provide access to abutting uses, rather than to provide through traffic routes.

Mixed-Use Development: Areas characterized by a wide variety of shopping, employment, entertainment, light industrial and residential uses. Mixed-use development may occur at the level of individual buildings or complexes, or at a larger scale within activity nodes or corridors.

Modal Split: The proportion of total person trips on various types of modes.

Mode: The types of transportation available for use such as rail, bus, vanpool, single-occupant auto, or bicycle.

Multi-Modal: A term referring to facilities designed for and used by more than one type of mode.

Neighbourhood: A collection of one or more subdivisions, usually served by local park facilities, a public school, and a variety of locally-oriented commercial and retail facilities.

New Urbanism: New approaches to land use and development that borrow from an older pattern of urban development. These elements include a commercial core within walking distance of a majority of residents, a well-connected street network, narrow streets with curbside parking and back-lot alleys, mixed uses and varying densities of housing. The design principles lead to a pattern of development that is conducive to transit and pedestrian access and to reducing dependence on the automobile.

Park-and-Ride Facility: Parking lots with limited facilities to accommodate transit riders. They serve as collection or transfer points for bus, car or vanpool, or light rail service.

Parking Management: Actions taken to alter the supply, operation, or parking demand in an area.

Peak Period: The hours when traffic is greatest. Generally, there is a morning peak (6:30-9:00AM) and an afternoon peak period (3:30-6:30 PM) during the work week.

Pedestrian-Oriented Uses: Uses that rely on pedestrian traffic for the majority of their business. Such uses typically include specialized retail and food stores, restaurants,

personal service establishments, convenience stores, repair shops, etc. Wherever possible, these uses should be located at street level along activity corridors and in activity nodes, and their major entrances should open directly onto the street.

Planned Unit Development (PUD): Large area that is planned and zoned as a unit instead of individual parcels, allowing a well-configured internal configuration and greater flexibility in design.

Preferential Parking: Parking spaces reserved exclusively for car/vanpools in parking lots. These parking spaces are generally located closer to building entrances or have other positive features that make them very desirable. Such parking spaces may be used as an incentive to encourage ridesharing.

Region/Regional Municipality: An upper tier municipality, comprising a number of local or area municipalities, which carries out regional-scale planning functions. Counties or district municipalities that undertake planning functions are also included in this definition.

Reverse Commute: Travel during the peak period that flows in the direction opposite the peak direction.

Reverse Lotting: Lots located adjacent an arterial or collector road that front onto an internal street, while the rear yard faces onto the arterial or collector road. Landscaping and privacy fences are usually located adjacent the arterial or collector road, and access onto the arterial or collector is strictly limited.

Ridesharing Program: Any programs sponsored by public agencies or the private sector to promote the use of carpools, vanpools, or buspools.

Right-of-Way: A general term denoting land devoted to transportation purposes.

Secondary Plan: A land use policy plan for a district or large neighbourhood within a municipality which provides more detailed land use policies and designations than those found in a municipal official plan.

Service Area: A geographic locale or region where transit service is provided.

Setback: The distance from the property line to a building.

Single-Occupant Vehicle (SOV): Vehicles carrying one occupant, usually a private auto.

Site Plan: A developer-designed plan showing where on a specific parcel, building, roads, utilities, etc., will be located.

Streetscape: The overall character, design quality, and particular physical elements that occupy the ground level public environment. Streetscape elements may include the paving materials, curbs, landscaping, lighting, and street furniture such as benches, water fountains, or bicycle racks.

Subdivision Regulation: A law or regulation, adopted by the municipality's governing body after referral from an appointed advisory board such as a Planning Commission and following a public hearing. Subdivision regulations govern the division of a lot, tract, or

parcel of land into two or more lots, tracts, parcels or other divisions of land for sale, development or lease.

Suburban Activity Centre (SAC): A component of suburban growth whereby commercial and employment – generating uses are concentrated into developments whose influence rivals that of a region's downtown.

Sustainability: Refers to the ability of a society, ecosystem or any such on-going system to continue functioning into the indefinite future without being forced into decline through the exhaustion or overloading of key resources on which that system depends.

Tax Increment Financing: A technique allowing new tax revenues, generated by new development, to be retained and put to public use in and around the area where the development has taken place.

Timed Transfer: A set of bus routes and schedules coordinated so that transfers between all lines, destined for a particular transit centre, are synchronized to save passengers' time.

Transfer Nodes: Major transportation interchange points which act as focal points in the transportation network, and are designed to facilitate transfers between transportation modes such as auto/commuter rail, rapid transit/local bus service, etc. As urban areas develop, a transfer node may serve as a focal point for the development of a mixed-use activity node. transfer nodes are often associated with larger urban areas. In the Greater Toronto Area, they are usually referred to as Gateways.

Transfer of Development Rights (TDR): A program in which the owner of environmentally sensitive, historically significant, open space, or preservation areas with high development potential land can sell or trade the land's development potential to an owner of land where higher density development is desirable.

Transit Area Plan: Part of the comprehensive plan or a separate plan, which is specifically for the area around a transit station or stop, which establishes the land use pattern and design concept.

Transit Centre: A facility providing connections between buses serving different routes or between different transportation modes such as between ferries and buses.

Transit Corridor: A major right-of-way that carries high volumes of transit and other HOV vehicles.

Transit Mall: A section of a transit route, usually located in a major activity corridor or town centre, where transit vehicles are the exclusive or dominant form of transportation in association with pedestrian travel and possibly bicycling.

Transit Node: A point where two or more transit routes intersect, usually having higher density and/or more mixed-uses than occur in areas further removed from the intersection.

Transit-Oriented Development (TOD): Moderate and high density housing along with complementing public uses, jobs, retail and services, are concentrated in mixed use developments located as strategic points along the regional transit system. The location,

design, configuration and mix of uses in a TOD provides an alternative to current suburban development trends by emphasizing a pedestrian-oriented environment and reinforcing the use of public transportation.

Transit Overlay District: Zoning tool where the zoning is 'overlaid' on the underlying base zone, modifying or replacing the land use and design provision with regulations pertaining to or directed at specific transit-oriented development.

Transit-Compatible/Supportive Land Use: A general term applying to higher density or intensity land uses and activities, usually urban, that are designed and located to encourage ridership on public transportation.

Transportation Demand Management (TDM): Strategies attempt to reduce peak period automobile trips by encouraging the use of high occupancy modes through commuter assistance, parking incentive, and work policies which alter the demand for travel in a defined area in terms of total volume, the use of alternative modes of travel, and the distribution of travel over different times of the day.

Transportation Management Association (TMA): A coalition of local businesses and other concerned parties that develops goals and appropriate strategies involving the improvement of transportation within a particular area.

Travel Demand Management (TDM): Seeks higher levels of efficiency in travel through altering the behavior of travelers toward more efficient modes, fewer or shorter vehicle trips, of travel during periods of lower demand.

Vehicle Miles Traveled (VMT): An average number that describes the total number of miles traveled in an automobile per individual for a particular area. An increase in VMTs within urbanized areas generally indicated more traffic and a worsening of air quality.

Zoning By-law or Zoning Ordinance: A municipal instrument adopted after referral from the Planning Commission for comment and following a public hearing. The zoning provisions divide a municipality into districts and prescribes land use type, land use relationships, densities, height and setback, bulk distribution, required and accessory parking, loading and servicing requirements, and performance standards, within a defined municipal boundary.

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